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DANTE

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PHYSICIAN

A. G. DRURY, M. D.



DANTE.

Considered by a commission of the Italian
Government the most authentic like-
ness of Dante.

The Dante Society.
Compliments of
A. G. Drury

Dante: Physician

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CINCINNATI,

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College of Ohio, Medical De-
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CINCINNATI:
THE LANCET-CLINIC,
1908.

"As if the doctor should give to a knight
the written aphorisms of Hippocrates, or rather
the technics of Galen."—*Convito I, Canto I.*

Chap

INTRODUCTION.

The constant occurrence in the works of the poet, of medical terms and phrases; the many descriptions of diseases and injuries; the evident knowledge of the uses of remedies; the positive statements in regard to medical and surgical practice, and the great familiarity with the collateral sciences displayed by him, have suggested this compilation.

The fact that he was a politician, a poet, and a learned theologian, in no way contradicts the statement that he was also a learned physician, for many of the priesthood, even in the higher ranks, practiced medicine in the Middle Ages.

That he was at any time a practitioner in a strict sense is not intimated or believed, but that he was thoroughly prepared for the practice of medicine has more and more impressed me as the work has progressed.

Quotations from the *Vita Nuova* are from Rosetti's translation, unless other-

wise stated; those from the Convito are from the translation of Elizabeth Price Sayer; and those of the Divine Comedy from Longfellow's or Cary's versions.

DANTE: PHYSICIAN.

YOUTH.

When we consider the volumes that have been written on the life of Dante, some of them by his contemporaries, and many by his countrymen in the centuries following his death, the wonder ever grows that we have so little positive knowledge of his birth, family, youth and education.

We know that he was born in 1265, because he states positively that he was nine years old when he went with his father to the May-day reception at the house of Folco Portinari, the father of Beatrice, in 1274.¹

We know that his birth occurred between the 18th of May and the 17th of June, because he says, in the twenty-second canto of the *Paradise*, that he was born when the sun was in Gemini, which

1. Boccaccio, *Life of Dante*.

occurred at that time in the year 1265. Of his mother we know nothing more than her name—Donna Bella. His father, a learned counsellor-at-law, died when he was ten years old.

EDUCATION.

Of his early education we have no exact knowledge. He is silent on this subject, and his biographers uncertain and somewhat contradictory. The studies then taught in the lower schools were: Grammar, Latin (not that of the language of the day), rhetoric, and dialectics, called the *trivium*; and arithmetic, geometry, astronomy and music, called the *quadrivium*.

Leonardo Bruni, born in 1370,² says: "In his childhood, being liberally nurtured, and entrusted to teachers of letters, he very soon gave evidence of extraordinary powers, wonderfully adapted to excellent things." Bruni further says: "By study of philosophy, theology, astrology, arithmetic, geometry, history, and by the turn-

2. Vita di Dante.

ing over of many curious books, he acquired the sciences he was to adorn and explain in verses."

Whether he studied under the direct and personal supervision of Brunetto Latini, one of the most brilliant scholars of his time, is disputed; the weight of evidence, however, shows that he did.

Boccaccio tells us that he became very familiar with Virgil, Horace, Ovid and Statius, and that "being taken by the sweetness of knowing the truth of the things concealed in the heavens, and finding no other pleasure dearer to him in life, he left all other worldly care and gave himself to this alone, and, that no part of philosophy might remain unseen by him, he plunged into the deepest recesses of theology, and so far succeeded in his design that he came to know of the Divine Essence, and of the other Intelligences, all that the human intellect can comprehend." Later in life he studied in the Universities of Bologna, Padua, Paris, and Oxford.

Mr. Norton says: "Dante was a born student, as he was a born poet, and had he never written a single poem he would still have been famous as the most profound scholar of his time."

"It has been estimated that so far as concerns the classical authors alone, *not including the wide field of scholastic theology and philosophy*, over one thousand passages may be found in Dante's works as direct citations, obvious references, or evident allusions, showing the wide range of his research and reading in this branch of learning."³

After the death of Beatrice he turned for consolation to the study of philosophy, and he says he frequented the schools of the religious and the disputations of the philosophers for about thirty months.

One result of these studies was the work called "The Convito," which was intended to fill fourteen treatises, and which, if completed as the author intended, would have been an encyclopedia of medieval

3. "Epic of the Fall of Man," Gurteen.

knowledge, and doubtless would have proved his right to be ranked with the foremost medical men of his time.

Medical Education.—In the thirteenth century the Emperor Frederic II (1194-1250) issued an edict, in virtue of which no one could practice medicine in the Kingdom of Naples who had not been examined and created a master by the College of Salerno. To effect this, he must study logic three years, and medicine, including surgery, five years, according to Sprengel,⁴ or two years according to Malgaigne.⁵

At the end of his term the student was examined publicly on the therapeutics of Galen, the first book of Avicenna, and the Aphorisms of Hippocrates. His diploma was to be confirmed by an officer of the State, and he was obliged to continue a year longer under an experienced physician. He who wished to practice surgery only was obliged to follow the

4. History of Medicine.

5. Oeuvres d' A. Pare.

teachings of the faculty for one year only, but he must devote himself to the study of anatomy above all.⁶

The study of medicine according to medieval notions was closely bound up with the study of Aristotelian philosophy.⁷ Aristotle, regarded in Northern Europe chiefly as the basis of speculative philosophy, and as the indispensable propædæutic for the scholastic theologian, was in Italy studied largely as constituting the scientific basis of medicine.

It is the especial glory of the Bolognese Medical School that it was the earliest real home of anatomical inquiry. It was one of the first schools at which the old religious prejudice against dissection succumbed to the advance of the scientific spirit. Dissection was practiced at Bologna at least as early as the time of Thadæus.⁸

“Medicine, to which fresh vigor had

6. Renouard, *History of Medicine*, *Comegys*.

7. Rashland: *Universities of Europe in the Middle Ages*, vol. 1.

8. See notes on *Paradise*, XII.

been imparted by the Arab and Jewish physicians encouraged by the Suabian rulers of Naples, possessed the University of Salerno; was the leading subject at the University of Padua, and at Bologna was second only to jurisprudence.”⁹

“There is no doubt that in the latter half of 1304 Dante went to the University of Bologna. It is uncertain how long he remained there, but probably not later than the 1st of March, 1306, at which time he was expelled from Bologna. Thence he went to the University of Padua. Thus we find he spent two years in study, and took no part in the factions of his fellow-citizens.”¹⁰

It is evident that he was in these universities at the times above mentioned for no other purpose than the study of medicine and the collateral sciences, for neither of them were prominent in the study of theology. For this latter he went to Paris at a later date.¹¹

9. Boswell: *Vita Nuova*.

10. Balbo: *Life of Dante*, vol. ii, pp. 20-21.

11. 1308 or 1309.

"A final blow at feudalism was struck in 1282, by a law which limited all participation in the government of the city to those who had been enrolled in one of the seven Guilds of the Greater Arts, which had created its wealth. These Seven Arts were: (1) Judges and notaries, (2) merchants of Calimala, (3) money-changers, (4) wool-staplers, (5) silk merchants, (6) physicians and apothecaries,¹² and (7) furriers."

Out of these were chosen the *Priori delle Arti*; at first three, then six, then twelve, who held the office with almost supreme authority, for two months at a time.

In 1292, probably as the result of the commercial distress, there was another revolutionary change, brought about by Gian della Bella, who stirred up the *plebs* by dwelling on the grievances to which they were still subject, and, as one of the *Priori*, with the help of his colleagues and the *Podesta*, Taddeo de Bruxati of Bre-

12. Most authorities make these fifth.

scia, and the Captain of the people, Currado da Soucina of Milan, passed his memorable Ordinances of Justice. Among these was one which had a notable influence on Dante's life. The law which confined public offices to members of the Greater Arts had been evaded by a merely nominal enrollment.

It was now enacted that no one should be elected as Prior who was not actually carrying on business in the art of his guild.¹³ One result of this was that when Dante resolved to take his part in public life, he had to qualify for one of these guilds, and, as was natural in a student of natural science, he chose that of the physicians and apothecaries. It lies in the nature of the case that admission to that guild implied an examination.¹⁴ As has just been shown, it involved in Dante's case an actual practice in the profession. *And of both studies and practice his works show sufficient traces.* His library con-

13. Napier: Florentine History, 1846, vol. i, pp. 345-351.

14. See p. —, these notes.

tained Hippocrates and Galen and Dioscorides, probably also translations of the medical treatises of Avicenna and Averrhoes,¹⁵ possibly the writings of Jewish physicians and those of the great medical school at Salerno. He became acquainted with the foulness of Italian hospitals,¹⁶ with the symptoms of leprosy,¹⁷ dropsy,¹⁸ fever,¹⁹ looked with compassion on what is perhaps the most piteous of all sights, the frenzied delirium of a child.²⁰ He observed the details of the treatment of one special class of disease at the baths of Bulicame.²¹ He mastered, by dissection or by books, the mysteries of embryology,²² and with them faced the question of the origin of the human soul, the theories of creation or transmission.²³ As one of Gian

15. Hell, IV.

16. Hell, XXIV.

17. Hell, XXIX.

18. Hell, XXX.

19. Hell, XXX.

20. Paradise, I.

21. Hell, XIV.

22. Purgatory, XXV.

23. Purgatory, XVI.

della Bella's ordinances fixed thirty as the minimum age for admission to public functions, Dante had to wait till 1295 before his name was inscribed in the register of the Guild.²⁴

In a register from 1297 to 1300, of the Arts of the Physicians and Druggists, the *fifth* of the seven *major arts*, Dante is registered: "Dante d'Aldighiero degli Aldighieri, poeta fiorentino."²⁵

Balbo²⁶ says: "Dante could not really have been a physician or a druggist; for having entered into this art between the thirty-second and thirty-fifth year of his life, it is not possible that he should have done so in order to begin to practice at so ripe an age, nor do we find this circumstance mentioned in any other place; *he must therefore have entered this Art in order to cancel the effect of an oppressive law.*"

We have seen above how impossible it was to evade that law. Moreover, the evi-

24. Dean Plumptre: Dante, vol. i, B. LXI.

25. Pelli.

26. Vol. I, p. 162.

dence from his writings is overwhelming that he was a thoroughly educated physician, if, indeed, not a practitioner in the ordinary sense of the term.

The fact that Dante was a thorough master of theology—"Dantes theologus, nullius expers," he was called by Joannes de Virgilio²⁷—does not in the least militate against the belief that he was also a physician, for Plumptre²⁸ tells us the Archbishop of Mayence had risen to high dignity by his skill as a physician, at first in the court of Henry of Luxemburg, afterwards in that of other princes, finally in that of Clement V, who nominated him to the archbishopric on the ground that so skillful a healer of the bodies of men must also be a good physician of souls.

27. Fraticelli, P.: *Storia della Vita di Dante Alighieri*.

28. Dante, Vol. I, p. 94.

DE MONARCHIA.

"As a man of speculation, he recalls the secrets of nature, the phenomena of light, the idea and laws of physiology." ²⁹

"And to render the question clearer, we must observe that there is a certain end for which nature makes the thumb, and another different from this for which she makes the whole hand, and again another for which she makes the arm, and another different from all for which she makes the whole man." ³⁰ This is another of the many instances in which Dante uses the terms of medical science to illustrate his arguments.

"In the practice of medicine recourse may only be had to amputation and cauterizing when every other means of cure have been tried." ³¹ Though used to illustrate another matter, it is here spoken with a positiveness that shows absolute know-

29. Essay and Translation of the *De Monarchia*. By R. W. Church, p. 81.

30. *De Monarchia*, p. 181.

31. *Ibid*, p. 244.

lege of surgical practice and theory in his day.

"Since, then, man was not a sinner on the fourth day, for he did not then even exist, it would have been idle to make remedies for his sin, and this would be contrary to the goodness of God. For he would be a sorry physician who would make a plaster for an abscess which was to be, before the man was born." ³²

32. Ibid, p. 268-9.

THE VITA NUOVA.

The Vita Nuova was the earliest of Dante's more important writings. It was published when the poet was about twenty-five years of age, and in itself shows his early knowledge of medical science, and refutes the statements made by some of his biographers that he became a member of the Guild of Physicians and Apothecaries only in an informal way, and by evasion of the law, without a medical education. Proof of the improbability, indeed, the impossibility, of such action is elsewhere given.

"At that moment, I verily say, the *vital spirits*, which have their abode within the most secret chamber of the heart, began to tremble so violently as to be felt in my smallest pulses. . . . At that moment the *animal spirits*, which dwell within the lofty chamber (brain), whereunto all the *sensitive spirits* convey their perceptions, began to marvel greatly, and, addressing more especially the *visive spirits* (spirits of the

eyes), spake these words: '*Apparuit jam beatitudo vestra.*' At that moment the *natural spirits*, which dwell in that region where the nutrition is manifest, began to lament." ³³

According to the system of physiology current in the Middle Ages, and based on Bk. II of Aristotle's *De Gen. Animal.*, the vital functions of the body, the perceptions, the cogitations, etc., were carried on by means of certain very subtle essences called *spirits*, each of which had its own special domain in the body. Thus, some regulated the blood, others the digestion, others, whose seat was in the brain, the perceptions; and to these last the "sensitive spirits" conveyed the impressions which they had received from the external objects in the peripheral parts of the body. This theory was fully accepted by many of the most eminent men in science and philosophy so late as the latter part of the seventeenth century. In the language of the old psychology the term *imagination*

33. *Vita Nuova*, C. II.

had a wider sense than that now commonly given to it. The name was applied to the (supposed) formative faculty of the soul, which gave form to the perceptions of which the sensation and reflection supplied the matter.

After the manner of the times a certain objective reality was ascribed to it, and it was credited with the most powerful influences over the physical and psychical states, both of the owner and others. It played a most important part in the operations of magic, witchcraft, fascination and the like, and it is curious and interesting to note how through this mass of error pierce faint gleams of truth lately placed on a scientific basis by modern researches in mental suggestion, hypnotism, and the like. The imagination received and conveyed its impressions with most efficacy through the eyes, and this Dante, with his love for scientific method, doubtless had in mind in the passages of the present work referred to, and in many others.

Reginald Scot ("Discoveries of Witch-

craft") cites the great Neapolitan physician, Giovanni Battista Porta, as follows: "This fascination . . . though it begin by touching or breathing, is always accomplished and finished by the eye, as an extermination or expulsion of the spirits through the eyes, approaching to the heart of the bewitched, and infecting the same.

"And the lightest and finest spirits, ascending into the highest parts of the head, do fall into the eyes, and so on from thence sent forth, as being of all other parts of the body the most clear, and fullest of veins and pores, and with the spirit or vapor proceeding thence, is conveyed out as it were by beams and streams a certain fiery force." ³⁴

And then if I, whom other aid forsook,
Would aid myself, and, innocent of art,
Would fain have sight of thee as a last hope,
No sooner do I lift mine eyes to look
Than the blood seems as shaken from my heart,
And all my pulses beat at once and stop." ³⁵

34. The Vita Nuova and its Author, pp. 203-205. Boswell.

35. Vita Nuova, C. XVI. Rossetti.

In this sonnet, as in many other places, Dante well depicts the sudden flushing, the pallor and palpitation, with the seeming momentary cessation of the heart-beat, which occur when one is confronted with a sensation of exquisite pain or pleasure. Here is also a distinct association of the pulse with the action of the heart, and a near approach to the discovery of the circulation.

Witte³⁶ says that Dante distinguishes between the veins and arteries, and quotes the following:

O save me from her, thou illustrious sage!
For every vein and pulse throughout my frame
She hath made tremble.”³⁷

Galen demonstrated that the arteries contained blood at every period of life.

“A few days after this my body became afflicted with a painful infirmity, whereby I suffered bitter anguish for many days, which at last brought me into such weakness that I could no longer move. And I

36. *Essays on Dante*, translated by Lawrence and Wicksteed, p. 21. See *Purgatory*, IX.

37. *Hell*, C. I.

the *spirits of my eyes* became especially friendly to her; and so disposed that they depicted her to be such that my good-will was content to espouse itself to that image." ⁴⁴

"As human nature transfers in the human form its preservation of the father to the son, because it cannot in this father preserve perpetually its effect." ⁴⁵

"And here you must know, that although many things in one hour can come into the eyes, truly that which comes by a straight line into the point of the pupil, that truly one sees, and that only is sealed in the imaginative part. And this is because the nerve by which the visible spirit runs is directed to that part, and thereupon truly one eye cannot look on the eye of another so that it is not seen by it; for as that which looks receives the form of the pupil by a right line, so by that same line its form passes into that eye which gazes." ⁴⁶

Al-Farabi (Alfarabio), one of the earli-

44. Convito, II. C. II. See Vita Nuova, C. II.

45. Convito, C. IX.

46. Convito, C. X, p. 74.

est Arabian philosophers, died in Damascus in 950 A.D. Philosophy among the Arabs was originally an extension of the related sciences of astronomy and medicine, and the philosophers were physicians. He was physician at the court of Seif-Eddaula. In his work *De Scientiis* he enumerates six orders of sciences. He is quoted by Dante in the Third Treatise of the *Convito* in a discussion of causes and effects.

"Therefore the vegetative power, whereby one lives, is the foundation upon which one feels, that is, sees, hears, tastes, smells and touches; and this vegetative power of itself can be the soul vegetative, as we see in all the plants. The sensitive cannot exist without that. We find nothing that feels and does not live, and this sensitive power is the foundation of the intellectual, that is, of the reason; so that in animate mortals, the reasoning power is not found without the sensitive. But the sensitive is found without reason, as in the beasts,

and in the birds, and in the fishes, and in any brute animal, as we see . . . And all these most noble virtues, and the others which are in that excellent power (the soul), are designated by that one word, mind. For only of man and of the divine substances is this mind predicated. Neither was it ever predicated of brute animals; nay, of many men who appear defective in the most perfect part, it does not seem that it ought to be, or that it could be, predicated; and therefore such as these are termed in the Latin tongue *amenti* and *dementi*.”⁴⁷

“Wherefore it is to be known that each thing has its especial love. The bodies first composed, such as are the minerals, have love for the place where their generation is ordained, and in which they increase, and from which they have vigor and power.

“Each of the plants which are first animated, that is, first animated with a vegetative soul, has most evident love for a

47. Convito, C. III. C. II, pp. 104-5.

particular place, according as its nature may require; and therefore we see certain plants almost always grow by the side of the streams, and certain others upon the mountain tops, and certain others grow by the seashore, or at the foot of hills, which, if they are transplanted, either die entirely or live a sad life. The brute beasts have a most evident love, not only for places, but we see also their love towards each other. Men have their own love for things perfect and excellent; and since man, though his soul is one substance alone, because of his nobility, partakes of the nature of each of these things, he can possess all these affections, and he does possess them all. By his part in the nature of the *simple body*, as earth, naturally it tends downward; therefore, when he moves his body upwards, he becomes more weary. Because of the *second nature* of the mixed body, it loves the place of its generation, and even the time; and therefore each one is naturally of more power in his own place and in his own time than in any other.

"And because of the *third nature*, that is, of the plants, man has a love for certain food, not inasmuch as it affects the senses, but in so much as it is nutritious; and that particular food does the work of that most perfect nature, while a certain other food, dissimilar, acts but imperfectly. And therefore we see that certain food will make men handsome, and stronglimbed, and very brightly colored, and certain other food will do the opposite of this. And by the *fourth nature*, of the animals, that is the sensitive, man has the other love, by which he loves according to the sensible appearance, like the beasts; and this love in man has need of control, because of its excessive operation in the delights given, especially through sight and touch."⁴⁸

"And I was alarmed, so that I seemed almost like one dazed, even as he who, looking with the eye along a direct line, sees first the nearest things clearly; then, proceeding, it sees them less clearly; then,

48. Convito, III. C. III, pp. 106-107.

further on, doubtfully; then, proceeding an immense way, the sight is divided from the object, and sees nothing."⁴⁹

As showing Dante's knowledge of reflection and refraction of light, I quote as follows:

"Albertus Magnus says in his book 'On the Intellect,' that certain bodies, through having mixed in themselves an excess of transparent brightness, so soon as the sun sees them they become so bright that, by the multiplication of light within them, their aspect is hardly discernible, and from themselves they render back to others great splendor or brilliancy.

"Sure I am that by being entirely transparent, not only do they receive the light, but that they do not intercept it; nay, they pass it on, like stained glass, colored with their own color, to other things. And there are certain other bodies so overpowering in the purity of the transparency that they become so radiant as to overpower the adjustments of the eye, and you

49. Convito, III. C. III, p. 108, Optical effects.

cannot look at them without fatigue of sight; such as are the mirrors. Certain others are so free from transparency, that but little light can they receive; as is the earth.”⁵⁰

“Other things, indeed, are visible, but it is not their property to be so, nor to be tangible, as in form, height, number, motion and rest, which are said to be subject to the common sense, and which we comprehend by union of many senses; but of color and light it is the property to be visible, because with the sight only we comprehend them. These visible things, both those of which it is the property and those subject to the common sense, inasmuch as they are visible, come within the eye; I do not say the things, but their form; through the transparent medium, not really, but by intention, as it were through transparent glass. And in the humor which is in the pupil of the eye this current which makes the form visible is completed, because that humor is

50. Convito, III. C. VII, p. 121-122.

closed behind like a mirror which has its glass backed with lead ; so that it cannot pass farther on, but strikes there, after the manner of a ball, and stops ; so that the form which does not appear in the transparent medium, having reached the disk behind, shines brightly thereon ; and this is the reason why the image appears only in the glass which has lead at the back.

“From this pupil the visual spirit, which is continued from it to the part of the brain, the anterior, where the sensitive power is, suddenly, without loss of time, depicts it as in the clear spring of a fountain ; and thus we see. Therefore, in order that its vision be truthful, that is, such as the visible thing is in itself, the medium through which the form comes to the eye must be without any color, and so also the humor of the pupil. And this is the reason why they who wish to make things appear of a certain color in a mirror interpose that color between the glass and the lead, the glass being pressed over it.

“Plato and other philosophers said, indeed, that our sight was not because the visible thing came into the eye, but because the visual virtue went out to the visible form. And this opinion is confuted by the Philosopher (Aristotle) in that book of his on Sense and Sensation. Having thus considered this law of vision, one can easily perceive how, although the star is always in one way bright, clear and resplendent, and receives no change whatever except that of local movement, yet from many causes it may appear dim and obscure, since it may appear thus on account of the medium, *the atmosphere*, that changes continually. This medium changes from light to darkness according to the presence or absence of the sun; and during the presence of the sun the medium, which is transparent, is so full of light that it overpowers the star, and therefore it no longer appears brilliant. This medium also changes from rare to dense, from moist to dry, because of the vapors of the earth which rise continually. The

medium, thus changed, changes by its density the image of the star which passes through it, makes it appear dim, and by its moisture or dryness changes it in color. In like manner it may thus appear through the visual organ, that is, the eye, which on account of some infirmity, or because of fatigue, is changed into some degree of dimness or into some degree of weakness. So it happens very often, owing to the membrane of the pupil becoming suffused with blood on account of some corruption produced by weakness, that things all appear of a red color; and therefore the star appears so colored. And owing to the sight being weakened, there results in it some depression of the spirit, so that things do not appear united, but scattered, almost in the same way as our writing does on a wet piece of paper. *And this is the reason why many persons, when they wish to read, remove the paper to some distance from the eyes, in order that the image thereof may come within the eye more easily and more subtly, and thereby*

the lettering is left impressed on the sight more distinctly and correctly.

"For like reason the star may also appear blurred; and I had experience of this in the same year in which this song was born, for, in trying the eyes very much in the labor of reading, the visual spirits were so weakened that the stars all appeared to me to be blurred by some white mist; and by means of long repose in shady and cool places, and by cooling the ball of the eye with spring water, I reunited the scattered powers, which I restored to their former good condition."⁵¹

The following quotation, though the evil to be corrected is a moral, not a physical one, shows very plainly Dante's strong inclination to medical phraseology, and this inclination is manifested in all his later works; less in the Vita Nuova, his earliest production, though even there it crops out: "And since the intention of this song is directed to a remedy so requisite, it was not well to speak under any figure of

⁵¹. Convito, III, C. IX, pp. 132-5. See p. 17 V. N. these notes.

speech; but it was needful to prepare the medicine speedily, that speedy might be the restoration to health, which being so corrupted hastened to a hideous death."⁵²

In the same treatise he says: "There are other things which are not arts, but appear to have some relation with them. To know the virtue of the herb may be below the science of medicine, or rather below its most noble teaching."⁵³

Dante knew all about the domestic practice of medicine, as much in vogue in his day as in ours.

"Also through sickness or defects of body, it is possible for the mind to be unsound or sick; even as through some primal defect at birth, as with those who are born fools (the *amenti* referred to in the Third Treatise, second chapter), or through alteration in the brain, as with madmen.

"And of this mental infirmity the law speaks when it says: In him who makes a

52. Convito, IV, C. I, p. 165.

53. Convito, IV, C. IX.

will or testament, health of mind, not health of body, is required.”⁵⁴

“And therefore I say that when the human seed falls into its receptacle, that is, into the matrix, it bears with it the virtue or power of Heaven, and the virtue or power of the aliments united or bound together, that is the involution or complex nature of the seed.”⁵⁵ Preceding and following this quotation, Dante discusses at great length the evolution of body and soul, quoting Avicenna, Algazali, Plato and Pythagoras; falling back as usual on the teachings of Aristotle. In the same strain he discusses the evolution of species.⁵⁶ “And as it is with the blades of grain which, when they first shoot forth, have in the beginning one similar appearance, being in the grass-like stage, and then, by process of time, they become unlike . . . and not only in the blades of corn, but in men and beasts there is the same similitude.”

54. Convito, IV, C. XV, p. 225.

55. Convito, IV, C. XXI, pp. 240-241.

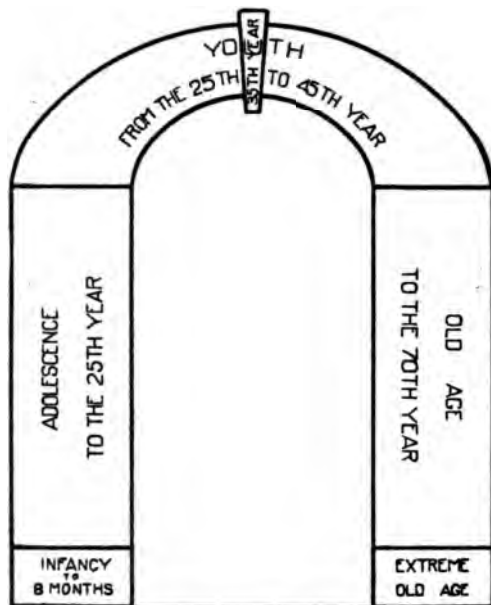
56. Convito, IV, C. XXII, pp. 244-245.

Dante thus describes at length the different stages in the life of man :

"Returning to the proposition, I say that human life is divided into four ages or stages. The first is called Adolescence, that is, the growth or increase of life ; the second is called Youth, that is, the age which can give perfection, and for this reason one understands this youth to be perfect because no man can give except of that which he has ; the third is called Old Age ; the fourth is called Senility, extreme old age.

"Of the first no one doubts, but each wise man agrees that it lasts even to the twenty-fifth year ; and up to that time our soul waits for the increase and embellishment of the body. While there are many and very great changes in the person, the rational part cannot possess perfectly the power of discretion ; wherefore, the civil law wills that, previous to that age, a man cannot do certain things without a guardian of perfect age.

"Of the second, which is the height of



ARCH OF LIFE

our life, the time is variously taken by many. But leaving that which philosophers and medical men write concerning it, and returning to the proper argument, we may say that, in most men in whom one can and ought to be guided by natural judgment, that age lasts for twenty years. And the reason which leads to this conclusion is, that the height or supreme point of our arc or bow is in the thirty-fifth year; just so much as this age has of ascent, so much it ought to have of descent; and this ascent passes into descent, as it were, at the point, the center, where one would hold the bow in the hand, at which place a slight flexion may be discerned. We are of opinion, then, that youth is completed in the forty-fifth year.

"And as adolescence is in the twenty-five years which mount upwards to youth, so is the descent, that is, old age, an equal amount of time which succeeds to youth; and thus old age terminates in the seventieth year.

"But because adolescence does not begin

at the beginning of life, taking it in the way which has been said, but about eight months from birth; and because our life strives to ascend, and curbs itself in the descent; because the natural heat is lessened and can do little, and the moist humor is increased, not in quantity, but in quality, so that it is less able to evaporate and be consumed; it happens that beyond old age there remains of our life an amount, perhaps of about ten years, a little more or a little less; and this time of life is termed extreme old age, or senility. Truly, these ages may be longer or shorter according to our complexion or temper and our constitution or composition."⁵⁷

57. *Convito*, IV, XXIV, p. 253.

HELL.

Zeno and *Dioscorides* well read
In nature's secret lore. Orpheus I marked
And Linus, Tully and moral Seneca,
Euclid and Ptolemy, *Hippocrates*,
Galenus, *Avicen*, and him who made
That commentary vast, *Averroes*."⁵⁸

"In *Dioscorides*, the physician and botanist of Anizarba (second century, A.D.), and in *Hippocrates* and *Galen*, we may trace the poet's studies as a member of the Florentine Guild of Apothecaries."⁵⁹

O save me from her, thou illustrious sage!
For every vein and pulse throughout my frame
She hath made tremble.⁶⁰

Dante was fleeing in terror from the She-Wolf when he meets *Virgil* and thus cries out to him.

In the second chapter of the *Vita Nuova* he records a similar acceleration of the pulse; in that instance, however, from great joy.⁶¹

58. Hell, C. IV.

59. Plumptre: Dante, vol. i.

60. Hell, C. I. See p. — this paper.

61. *Vita Nuova*. Rossetti.

Mine eyes he loosed, and said : "Direct the nerve
Of vision now along that ancient foam"⁶²
There yonder where that smoke is most intense."⁶³

I am the one who both keys had in keeping
Of Frederick's heart, and turned them to and fro
So softly in unlocking and in locking,
That from his secrets most men I withheld;
Fidelity I bore the glorious office
So great, I lost thereby my *sleep* and *pulses*."⁶⁴

Insomnia, due to the cares and trials of a great office. Piero delle Vigne, friend and chancellor of Emperor Frederick II, was accused of treachery to his master. He was blinded and thrown into prison, where he is said to have committed suicide. Bismarck, the friend and chancellor of Emperor William I, of Germany, was a noted modern instance of insomnia from a like cause.

As from the Bulicame springs the brooklet.⁶⁵

The Bulicame or hot springs of Viterbo.

62. The Styx.

63. Hell, C. IX.

64. Hell, C. XIII.

65. Hell, C. XIV, Longfellow's notes.

"The city of Viterbo was built by the Romans, who sent the sick there on account of the baths which flow from the Bulicame, and therefore it was called Vita Erbo, that is, life of the sick, or city of life."

Such as he is who has so near the ague
Of quartan that his nails are blue already.⁶⁶

As one that falls,
He knows not how, by force demoniac dragged
To earth, or through obstruction fettering up
In chains invisible the power of man,
Who, risen from his trance, gazeth around,
Bewildered with the monstrous agony
He hath endured, and wildly staring sighs;
So stood aghast the sinner when he rose.⁶⁷

This, I think, will strike the medical reader as a very fine poetic description of an attack of epilepsy; and so, indeed, Benvenuto suggests (Longfellow's Notes).

And to the ailment came as soon the plaster.⁶⁸
Thus did appear, coming towards the bellies
Of the two others, a small fiery serpent,

66. Hell, C. XVII.

67. Hell, C. XXIV.

68. Hell, C. XXIV.

Livid and black as is a peppercorn,
And *in that part whereat is first received*
Our aliment [the umbilicus] it one of them
transfixed;
Then downward fell in front of him extended,
The one transfixed looked at it, *but said naught*;
Nay, rather with feet motionless he yawned,
Just as if sleep or fever had assailed him.⁶⁹

"In animals which do not die immediately from the effects of this poison (snake venom) the first signs of nerve poisoning are, drowsiness, incoördination, followed by loss of voluntary motion, convulsions or failure of reflex activity and death.

"From the results of the observations with pure venoms and their globulins and peptones upon respiration, it seems clear the *primary* action is to cause an increase in the number of respirations, and, *secondarily*, to diminish the respirations below normal.

"The alterations in the pulse-rate are dependent chiefly upon two antagonistic factors, which are active at the same time, the one tending to increase the rate and

69. Hell, C. XXV.

the other to diminish it. The former is found in the increased action of the accelerator centers and the other in a direct action on the heart.

"The variations in arterial pressure are due chiefly to three causes, depression of the vaso-motor centers, depression of the heart, and irritation and consequent constriction or blocking up of the capillaries." ⁷⁰

SYMPTOMS OF SNAKE BITE IN THE HUMAN SUBJECT.

"Cobra-bite.—The first symptom is a sensation of burning pain, more or less severe, at the seat of inoculation. This spot soon becomes red, tender and swollen. An interval of about half an hour usually occurs before the patient experiences any constitutional symptoms; he then feels intoxicated, *sleepy*, and weak in the legs; the weakness increasing until he is unable to stand. Profuse salivation, *paralysis of*

70. Researches upon the Venoms of Poisonous Serpents. Smithsonian Contributions to Knowledge. By S. Wier Mitchell and Edward T. Reichert.

the tongue and larynx, with inability to speak or swallow, soon supervene
The paralysis now becomes more decided and general; the patient lies on his back, incapable of movement."

"Bite of Australian Species of Snakes—
Constitutional symptoms appear in from fifteen minutes to two hours. The first symptom is almost invariably a feeling of faintness and an irresistible desire to sleep. On attempting to walk the gait becomes staggering, and the weakness in the legs increases until the patient is unable to stand alone." ⁷¹

*"Effect on Temperature.—*The effects of venoms on body temperature vary. Sometimes a rise is observed, sometimes a fall. In the case of viperine poisoning, together with the intense local edema and extravasation, the temperature is raised." ⁷²

The above quotations vividly demonstrate Dante's knowledge, either from per-

71. Mr. Charles James Martin and Dr. Calmette: *A System of Medicine*. Edited by Thomas C. Allbutt. Vol. II, p. 809 *et seq.*

72. *Ibid.*, p. 826.

sonal observation or from study, of a matter which to-day is the subject of prolonged experimental study, not only in America and Europe, but notably in India.

Though not altogether relevant to the subject in hand, Dante's description of the double transmutation of Guercio Cavalcanti and Buoso degli Abati is so fine that it should not be omitted:

He at the serpent gazed and it at him;
One through the wound, the other through the
mouth

Smoked violently, and the smoke commingled.
Henceforth be silent, Lucan, where he mentions
Wretched Sabellus and Nasidius,
And wait to hear what now shall be shot forth.
Be silent, Ovid, of Cadmus and Arethusa;
For if him to a snake, her to a fountain,
Converts he fabling, that I grudge him not;
Because two natures never front to front
Has he transmuted, so that both the forms
To interchange their matter ready were.
Together they responded in such wise
That to a fork the serpent cleft his tail,
And eke the wounded drew his feet together.
The legs together with the thighs themselves
Adhered so, that in little time the juncture
No sign whatever made that was apparent.

He with the cloven tail assumed the figure
 The other one was losing, and his skin
 Became elastic, and the other's hard.
 I saw the arms draw inwards at the armpits,
 And both feet of the reptile, that were short,
 Lengthen as much as those contracted were.
 Thereafter the hind feet, together twisted,
 Became the member that a man conceals,
 And of his own the wretch had two created.
 While both of them the exhalation veils
 With a new color, and engenders hair
 On one of them and depilates the other.
 The one uprose and down the other fell,
 Though turning not away their impious lamps,
 Under which each one his muzzle changed;
 He who was standing drew it tow'rds the temples,
 And from excess of matter, which came thither,
 Issued the ears from out the hollow cheeks;
 What did not backward run and was retained
 Of that excess made to the face a nose,
 And the lips thickened far as was befitting.
 He who lay prostrate thrusts his muzzle forward,
 And backward draws the ears into his head.
 In the same manner as the snail its horns;
 And so the tongue, which was entire and apt
 For speech before, is cleft, and the bi-forked
 In the other closes up, and the smoke ceases.
 The soul, which to a reptile had been changed,

Along the valley hissing takes to flight,
And after him the other speaking sputters.
Then did he turn upon him his new shoulders,
And said to the other: "I'll have Buoso run,
Crawling as I have done, along this road."⁷³

But even as Constantine sought out Sylvester
To cure his leprosy, within Soracte,
So this one sought me out as an adept
To cure him of the fever of his pride."⁷⁴

The legend was that in gratitude for a
miraculous cure of leprosy effected on
him by Pope Sylvester I, Constantine en-
dowed the pontiffs with the government
of Rome.

What pain would be if from the hospitals
Of *Valdichiana*, 'twixt July and September,
And of *Maremma* and *Sardinia*
All the diseases in one moat were gathered,
Such was it here, and such a stench came from it
As from putrescent limbs is wont to issue.

I do not think a sadder sight to see
Was in Aegina, the whole people sick,
When was the air so full of pestilence,
The animals, down to the little worm,
All fell . . . ,

73. Hell, C. XXV.

74. Hell, C. XXVII, Longfellow.

Than was it to behold through that dark valley
The spirits languishing in divers heaps.

I saw two sitting leaned against each other,
As leans in heating platter against platter,
From head to foot bespotted o'er with scabs;
And never saw I plied a curry comb
By stable-boy for whom his master waits,
Or him who keeps awake unwillingly,
As every one was plying fast the bite
Of nails upon himself, for the great rage
Of itching which no other succor had.⁷⁵

"Farther south is the Maremma, a region which, though now worse than a desert, is supposed to have been anciently both fertile and healthy In the younger Pliny's time the climate was pestilential. The Lombards gave it a new aspect of misery. Wherever they found culture they built castles, and to each castle they allotted a 'banditta' or military fief. Hence baronial wars. Whenever a baron was conquered, his vassals escaped to the cities, and the vacant fief was annexed to the victorious. Thus stripped of men, the lands returned into a state of nature. Some

75. Hell, C. XXIX, Longfellow.

were flooded by the rivers, others grew into horrible forests, which enclose and concentrate the pestilence of the lakes and marshes."⁷⁶

The Val di Chiana, near Arezzo, was in Dante's time marshy and pestilential.⁷⁷

'Twas at the time when Juno was enraged,
For Semele, against the Theban blood,
As she already more than once had shown;
So reft of reason *Athamas* became,
That, seeing his own wife with children twain
Walking encumbered upon either hand,
He cried: "Spread out the nets, that I may take
The lioness and her whelps upon the passage;"
And then extended his un pitying claws,
Seizing the first, who had the name *Learchus*,
And whirled him round, and dashed him on a
rock;
And she with the other burden drowned herself;
And at the time when fortune downward hurled
The Trojan's arrogance, that all things dared,
So that the king was with his kingdom crushed,
Hecuba, sad, disconsolate, and captive.
When lifeless she beheld *Polyxena*
And of her *Polydorus* on the shore
Of ocean was the dolorous one aware,

76. Forsyth: Italy, Longfellow's notes, p. 248.

77. Longfellow's notes, p. 326.

Out of her senses like a dog did bark,
So much the anguish had her mind distorted.⁷⁸

Athamas, king of Thebes. His madness
is thus described by Ovid.⁷⁹

Now Athamas cries out, his reason fled,
"Here, fellow-hunters, let the toils be spread.
I saw a lioness in quest of food
With her two young, run roaring in this wood."
Again the fancied savages were seen,
As through his palace still he chased his queen;
Then tore Learchus from her breast; the child
Stretched little arms, and on the father smiled—
A father now no more— who now begun
Around his head to twirl his giddy son,
And, quite insensible to nature's call,
The helpless infant flung against the wall.
The same mad poison in the mother wrought;
Young Melicerta in her arms she caught,
And with disordered tresses, howling, flies.
"O Bacchus! Evoe! Bacchus!" loud she cries.
The name of Bacchus Juno laughed to hear,
And said, "Thy foster-god has cost thee dear."
A rock there stood whose sides the beating
waves
Had long consumed, and hollowed into caves.

78. Hell, C. XXX, Longfellow's translation.

79. *Metamorphoses*, IV, Eusden's translation. Longfellow's notes, p. 329, *Inferno*.

The head shot forwards in a bending steep,
And cast a dreadful covert o'er the deep.
The wretched Ino, on destruction bent,
Climbed up the cliff—such strength her fury
lent;

Thence with her guiltless boy, who wept in vain,
At one bold spring she plunged into the main.

Hecuba, wife of Priam of Troy, and
mother of Polyxena and Polydorus.⁸⁰

When on the banks her son in ghastly hue
Transfixed with Thracian arrows strikes her
view,

The matron shrieked; her big swol'n grief sur-
passed

The power of utterance; she stood aghast;
She had not speech nor tears to give relief;
Excess of woe suppressed the rising grief.
Lifeless as stone, on earth she fixed her eyes,
And then looked up to heaven with wild sur-
prise.

Now she contemplates o'er with sad delight
Her son's pale visage; then her aching sight
Dwells on his wounds; she varies thus by turns,
Till with collected rage at length she burns,
Wild as the mother-lion when among
The haunts of prey she seeks her ravished
young;

80. Ovid, XIII, Stanyan's translation. Longfellow's
notes, p. 329.

Swift flies the ravisher; she marks his trace,
And by the print directs her anxious chase
So Hecuba with mingled grief and rage
Pursues the king, regardless of her age.

.

Fastens her forky fingers in his eyes;
Tears out the rooted balls; her rage pursues,
And in the hollow orbs her hand imbrues.
The Thracians, fired at this inhuman scene,
With darts and stones assail the frantic queen.
She snarls and growls, nor in a human tone;
Then bites impatient at the bounding stone;
Extends her jaws, as she her voice would raise
To keen invectives in her wonted phrase;
But barks, and thence the yelping brute betrays.

Athamas, the story goes, was driven to madness by the persecutions of Juno. While temporarily insane he seized his son, Learchus, from the mother's arms, and dashed him against a rock; Ino, his wife, threw herself with the other child into the sea. *Athamas* eventually recovered.

Hecuba was in like manner rendered insane by the cruel death of her children, as related above. The citation of these cases shows Dante's familiarity with their

histories, and his clear understanding of their medical features.

I saw one made in fashion of a lute,⁸¹
If he had only had the groin cut off
Just at the point at which a man is forked.
The heavy *dropsy*, that so disproportions
The limbs with *humors*, which it ill *concocts*,
That the face corresponds not to the belly,
Compelled him so to hold his lips apart
As does the *hectic*, who because of thirst
One towards the chin, the other upward turns.⁸²

The above not only shows Dante's perfect knowledge of the doctrines of "Coction and Crises," and its ever-attendant doctrine of the "Four Elements and Four Humors," but also his personal observation of the appearances of dropsy.

"The theory of Coction and Crises regarded disease as an association of phenomena, resulting from the efforts made by the conservative principle of life to effect a coction of the morbid matter in the economy. They thought that it could

81. The lute of the thirteenth century was shaped like a modern mandolin.

82. Hell, C. XXX, 149-157, Longfellow.

not be advantageously expelled until it was properly prepared, that is, until after its elements were separated and united with the natural humors of the body, so as to form an excrementitious material." ⁸³

It often happened that the vital principle, fatigued and broken down, was unable to effect coction.

And I to him: "Who are the two poor wretches
That smoke like unto a wet hand in winter?"
"One the false woman is who accused Joseph,
The other the false Sinon, Greek of Troy;
From acute fever they send forth such reek."

Recognition of the pathognomonic odors of febrile diseases could only come to Dante as an acute observer of such conditions. Note also his description of tympanites:

And one of them, who felt himself annoyed
At being, peradventure named so darkly,
Smote with his fist upon his hardened paunch,
It gave a sound as if it were a drum.

Sinon, the Greek, and Adamo, the false coiner, hold the following controversy:

83. Renouard's History of Medicine, Comegys.

"Rueful to thee the thirst be wherewith cracks
Thy tongue," the Greek said, "and the putrid
water

That hedges so thy paunch before thine eyes."
Then the false-coiner: "So is gaping wide
Thy mouth for speaking evil, as 'tis wont;
Because if I have thirst and humor stuff me,
Thou hast the burning and the head that aches."⁸⁴

The very tongue, whose keen reproof before
Had wounded me, that either cheek was stained,
Now ministered my cure. So have I heard,
Achilles' and his father's javelin caused
Pain first and then the boon of health restored.⁸⁵

"A Pelion ash which Chiron gave to
Achilles' father, cut from the top of
Mount Pelion, to be the death of he-
roes."⁸⁶

And of Achilles for his quinte spere
For he could with it both hele and drere."⁸⁷
Whose smile and frown, like to Achilles' spear,
Is able with the change to kill and cure."⁸⁸

We now had left him, passing on our way,
When I beheld two spirits by the ice
Pent in one hollow, that the head of one

84. Hell, C. XXX.

85. Hell, C. XXXI, Cary.

86. Iliad, XVI, Longfellow's notes, Hell, C. XXXI.

87. Chaucer: Squieres Tale.

88. Shakespeare, Henry the Sixth, Part Second.

Was cowl unto the other; and as bread
Is ravened up through hunger, the uppermost
Did so apply his fangs to the other's brain,
Where the spine joins it.⁸⁹

While I was still the form of bone and pulp
My mother gave me, the deeds I did
Were not those of a lion, but a fox.⁹⁰

As long as he was in the flesh.

Amid this dread exuberance of woe
Ran naked spirits winged with horrid fear,
Nor hope had they of crevice where to hide,
Or *heliotrope* to charm them out of view.⁹¹

The heliotrope of the Middle Ages was
a stone, not a flower, to which great virtue
was attributed in protecting from the ef-
fects of snake poison. It could also ren-
der one invisible.

Now though the cold had from my face dis-
lodged

Each feeling, as 't were callous, yet me seemed
Some breath of wind I felt.⁹²

Local anesthesia from intense cold. The
Poet knew the lack of sensation in callosi-
ties.

89. Hell, C. XXXII, Cary.

90. Hell, C. XXVII, line 73 *et seq.*, Longfellow.

91. Hell, C. XXIV, lines 89-93, Cary.

92. Hell, XXXIII, Cary.

PURGATORY.

Lo, how straight up to heaven he holds them
reared,
Winnowing the air with those eternal plumes,
That not like mortal hairs fall off or change."⁹³

Dante was aware not only of the regular process of moulting in birds, but also that human hair from birth to death has a definite period of duration, and that the old hair is constantly replaced by the new.

Thou shalt behold thyself like a sick woman,
Who cannot find repose upon her down,
But by her tossing wardeth off her pain."⁹⁴

Dante compares the political restlessness of Florence to the distress of a woman in labor.

The third, that uppermost rests massively,
Porphyry it seemed to me, *as flaming*
As blood that from a vein is spurting forth."⁹⁵

He notes the bright red color of arterial

93. Purgatory, C. II, Cary.

94. Purgatory, C. VI, Longfellow.

95. Purgatory, IX, Longfellow. See Vita Nuova, C. XVI, Hell, C. I, line 90, Longfellow.

blood, and that it *spurts forth* synchronously with the pulse. The same observation is made in the *Vita Nuova*; and in Hell, Canto I.

Do ye not comprehend that we are worms,
Born to bring forth the angelic butterfly,
That flieth unto judgment without screen?
Wherefore your spirit doth it float so high?
Like are ye to insects undeveloped,
Even as the worm in which formation fails."⁹⁶

That the poet was a naturalist is here shown by his knowledge of the development of the butterfly from the larval or caterpillar stage to the fully developed insect. He also shows that he knew of the condition of arrested development.

As when from off the water, or a mirror,
The sunbeam leaps unto the opposite side,
Ascending upward in the selfsame measure
That it descends, and deviates as far
From falling of a stone in line direct
(As demonstrate experiment and art),
So it appeared to me that by a light
Refracted there before me I was smitten;
On which account my sight was swift to flee."⁹⁷

96. *Purgatory*, C. X, Longfellow.

97. *Purgatory*, C. XV, Longfellow.

"There was Salvino degli Armati, great in the study of optics and experiments with lenses, mastering the laws of reflection and refraction, on which Dante delighted to dwell,⁹⁸ and famous as the inventor of spectacles,⁹⁹ probably therefore welcomed by the Poet, whose habits of study and brain excitement had affected his sight and confined him for many weeks to the seclusion of a darkened room. He was in Florence 1290-1295."¹⁰⁰

Endeavor, then, that soon may be extinct
As are the two already, the five wounds
That close themselves again by being painful.¹⁰¹

With that *swathing-band*
Which death unwindeth am I going upward.¹⁰²

His body in which the soul was swathed.
Forth from the hand of Him who fondles it
Before it is, like to a little girl

98. See *Paradise*, II, lines 94-105; *Purgatory*. XV, line 15; *Convito*, II, C. 10; *Convito*, III, C. 3, 6, 7, 9; *Vita Nuova*, C. 40.

99. G. J. Ferrazi: *Mannale Dantesco*, II, 20, 1865.

100. Dante, *Dean Plumptre* vol. i, p. 54.

101. *Purgatory*, C. XV, 79-81.

102. *Purgatory*, C. XVI, l. 37.

Weeping and laughing in her childish sport,
Issues the simple soul.¹⁰³

Dante rejected the doctrine of traducianism, *i. e.*, the generation of the soul by the same act that generates the body, which was maintained by the Arabians.

As sleep is broken when upon a sudden
New light strikes in upon the eyelids closed.¹⁰⁴

And he has one foot in the grave already,
Who shall ere long lament that monastery,
And sorry be for having there had power,
Because his son, in his whole body sick,
And worse in mind, and who was evil-born,
He put into the place of its true pastor.¹⁰⁵

Alberto della Scala, Lord of Verona, died in 1301, A.D. As the poem purported to have been written in 1300, evidences of impending dissolution may have been manifest to the poet. He made his natural son, who seems to have been mentally and physically a wreck, abbot of the Monastery of San Zeno.

103. Purgatory, C. XVI, Longfellow.

104. Purgatory, C. XVII, l. 40, Longfellow.

105. Purgatory, C. XVIII, l. 121, Longfellow.

And I by peradventure heard "Sweet Mary"¹⁰⁶
Uttered in front of us amid the weeping
Even as a woman doth who is in child-birth.

"It was the custom in those times," says
Venturi, "to call on the name of the Vir-
gin Mary amid the pains of child-bed."¹⁰⁷
The custom is quite as common to-day.

Ah, do not look at this dry leprosy,"
Entreated he, "which doth my skin discolor."¹⁰⁸

Leprosy, it is well known, was the great
scourge of medieval Christendom. It made
its appearance in Italy in the first century
A.D. Following the Crusades it spread
over Europe. In the thirteenth century,
it is said, there were nineteen thousand
lazar houses in Europe. Dante must have
seen much more of it than modern phy-
sicians.

And as the little stork that lifts its wing
With a desire to fly, and doth not venture
To leave the nest, and lets it downward droop,
Even such was I, with the desire of asking
Kindled and quenched, unto the motion coming

106. Purgatory, C. XX.

107. See Paradise, C. XV, l. 130, Longfellow.

108. Purgatory, C. XXIII.

He makes who doth address himself to speak.
Not for our pace, though rapid it might be,
My Father sweet forbore, but said: "Let fly
The bow of speech thou to the barb hast drawn."
With confidence I opened then my mouth,
And I began: "How can one meagre grow
There where the need of nutriment applies not "

.
Then he began: "Son, if these words of mine
Thy mind doth contemplate and doth receive,
They'll be thy light unto the How thou sayest.
The perfect blood, which never is drunk up
Into the thirsty veins, and which remaineth
Like food that from the table thou removest,
Takes in the heart for all the human members
Virtue informative, as being that
Which to be changed to them goes through the
veins.

Again digest, descends it where 'tis better
Silent to be than say; and then drops thence
Upon another's blood in natural vase.
There one together with the other mingles,
One to be passive meant, the other active,
By reason of the perfect place it springs from;
And being conjoined, begins to operate,
Coagulating first, then vivifying
What for its matter it had made consistent.
The active virtue, being made a soul
As of a plant (in so far different,
This on the way is, that arrived already),

Then works so much that now it moves and
feels

Like a sea-fungus, and then undertakes
To organize the powers whose seed it is.
Now, son, dilates and now distends itself
The virtue from the generator's heart
Where nature is intent on all the members.
But how from animal it man becomes
Thou dost not see as yet; this is a point
Which made a *wiser man*¹⁰⁹ than thou once err
So far, that in his doctrine separate
He made the soul from possible intellect,
For he no organ saw by this assumed.
Open thy breast to the truth that's coming,
And know that, just as soon as in the fetus
The articulation of the brain is perfect,
The primal motor turns to it well pleased
At so great art of nature, and inspires
A spirit new with virtue all replete,
Which what it finds there active doth attract
Into its substance, and becomes one soul,
Which lives, and feels, and on itself revolves.
And that thou less may wonder at my word,
Behold the sun's heat which becometh wine,
Joined to the juice that from the vine distills.
Whenever Lachesis hath no more thread,¹¹⁰
It separates from the flesh, and virtually
Bears with itself the human and divine;

109. Averroes.

110. When the thread of life is spun out.

The other faculties are voiceless all;
 The memory, the intelligence, and the will
 In action far more vigorous than before.
 Without a pause it falleth of itself
 In marvelous way on one shore or the other;¹¹¹
 There of its road it first is cognizant,
 Soon as the place there circumscribeth it.
 The virtue informative rays round about,
 As, and as much as, in the living members.
 And even as the air, when full of rain,
 By alien rays that are therein reflected
 With divers colors shows itself adorned,
 So there the neighboring air doth shape itself
 Into that form which doth impress upon it
 Virtually the soul that has stood still.
 And then in manner of the little flame,
 Which followeth the fire where'er it shifts,
 After the spirit followeth its new form.
 Since afterwards it takes from this its sem-
 blance,
 It is called shade; and thence it organizes
 Thereafter every sense, even to the sight.
 Thence it is that we speak, and thence we laugh;
 Thence it is that we form the tears and sighs,
 That on the mountain¹¹² thou mayhap hast
 heard.
 According as impress us our desires
 And other affections, so the shade is shaped,

111. Acheron, or the Tiber.

112. Purgatory.

And this is the cause of what thou wonderest
at.¹¹³

The above dissertation which Dante puts into the mouth of Statius may be found also in a briefer form in the *Convito*, Bk. IV, C. 21.¹¹⁴

It so much excites the enthusiasm of Varchi that he declares it alone sufficient to prove Dante to have been a physician, philosopher and theologian of the highest order.¹¹⁵ Averroes, the great commentator of Aristotle, whom Dante regarded as one of the greatest philosophers, held the opinion that there was only one universal intellect or mind pervading every individual of the human race. "Much of the knowledge displayed by the poet in this Canto appears to have been derived from the *Colliget* of Averroes."¹¹⁶

"Aristotle taught that the soul constitutes the essence of all living things, vegetable and animal. It is simple, indivis-

113. *Purgatory*, C. XXV, lines 10-108, Longfellow.

114. See also *Convito*, III, C. 2, 3; IV, 22.

115. Longfellow's notes, p. 314, *Purgatory*.

116. Cary, p. 416.

ible, and resides in whole in each part of the organized being, as one may assure himself by dividing a plant, and even certain animals, called insects; for after the division the separate parts continue to have the same life as the whole structure, which proves that each of them contains the soul integrally. The soul is endowed with four faculties, viz.: the *nutritive* or *vegetative*, the *sensitive*, *motive*, and *intellectual*. The first three reside in all parts of the body. The heart is the special residence of the intelligent soul. The *vegetative* faculty presides over nutrition and reproduction. It is indispensable to all things that are born, live and die, and is common to plants and animals. The *sensitive* faculty exists only in animals, of whom it constitutes the essence."¹¹⁷

Kuhns,¹¹⁸ speaking of the sea-fungus mentioned in Purgatory, C. XXV, 156, says: "This latter (sea-fungus), which stands for sponges, is introduced in the remarkable discussion of the origin and

¹¹⁷. Renouard's History of Medicine, Comegys.

¹¹⁸. Treatment of Nature in Dante's Divine Comedy.

development of a human being, which seems to adumbrate some of the truths of the youngest of modern sciences—biology. Man, according to Dante, passes through the vegetable and animal stages of life, and the transition state between man and animal is represented by the marine fungus." Of these same lines Dean Plumptre¹¹⁹ says: "The human life begins with the lower life of the plant, or rather of the zoöphyte, with this difference, that the latter has reached its appointed goal; the former is in process of evolution."

Neither unripe or ripened have remained
My members upon earth, but here are with me
With their own blood and their articulations.¹²⁰

He tells the spirits in purgatory that he is not dead, but present in his mortal body.

Our own transgression was hermaphrodite.¹²¹

The sin of sodomy.

And in the shaken plant such power resides,
That it impregnates with its efficacy

119. Dante, vol. i, p. 320.

120. Purgatory, C. XXVI, l. 55, Longfellow.

121. Purgatory, C. XXVI, l. 82, Longfellow.

The voyaging breeze, upon whose subtle plume
That wafted flies abroad; and the other land
Receiving (as 'tis worthy in itself
Or in the clime that warms it), doth conceive
And from its womb produces many a tree
Of various virtue. This when thou hast heard,
The marvel ceases, if in yonder earth
Some plant without apparent seed be found
To fix its fibrous stem.¹²²

Of this Witte¹²³ says: "My respected hearers will perceive how the poet seems in these lines to have a premonition of the microscopic fungus spore, pollen, and infusorial germs, which play so prominent a part in the natural sciences of our day."

One showed himself as one of the disciples
Of that supreme Hippocrates, whom nature
Made for the animals¹²⁴ she holds most dear.¹²⁵

- In "Luke: the Beloved Physician," Culbertson¹²⁶ says: "His education was perfected by the most careful Greek, Roman

122. Purgatory, C. XXVIII, Cary.

123. Essays on Dante. By K. Witte. Selected and translated by Lawrence and Wuksteed, p. 107.

124. Men.

125. Purgatory, C. XXIX, Longfellow.

126. Luke: The Beloved Physician. By J. C. Culbertson, M.D.

and Hebrew teachers of that period. For the prosecution of his professional studies there is a doubt as to whether he matriculated in the famous school on the island of Cos, or studied under a preceptor in Tarsus. Whichever the place, it is known that he became an expert clinician. As an every-day observer of cases, in their diagnosis, treatment, pathology and prognosis, his professional skill was not surpassed."

Not a drachm
Of blood remains to me that doth not tremble.¹²⁷

Soon as I had reached
The threshold of my *second age*, and changed
My mortal for immortal, then he left me.¹²⁸

Beatrice died in 1290, aged twenty-five years. See Dante's Arch of Life, Convito, IV, C. 24.

And that condition of the sight which is
In eyes but lately smitten by the sun
Bereft me of my vision some short while.¹²⁹

127. Purgatory, C. XXX, Longfellow.

128. Purgatory, C. XXX, Cary.

129. Purgatory, C. XXXII, Longfellow.

Longfellow, in his notes on this passage,
quotes from "Herrmann and Dorothea,"
Cochrane's translation, as follows :

Ev'n as the wanderer, who, as the sun dips his
orb in the ocean,
One last look still takes of the day-god, fast
disappearing ;
Then, amid rocks rude-piled, umbrageous for-
ests and copse woods,
Sees his similitude float, wherever he fixes his
vision ;
Finding it glancing before him and dancing in
magical colors.

PARADISE.

Whereupon she, after a pitying sigh,
Her eyes directed tow'rds me with that look
A mother casts on a delirious child.¹³⁰

Three mirrors shalt thou take, and two remove
Alike from thee, the other more remote
Between the former two shall meet thine eyes.
Turned towards these, cause that behind thy
back

Be placed a light, illuming the three mirrors
And coming back to thee by all reflected.
Though in its quantity be not so ample
The image most remote, there shalt thou see
How it perforce is equally resplendent.¹³¹
Of great Costanza this is the effulgence,
Who from the second Wind of Suabia
Brought forth the *third and latest puissance*.

"Constance, daughter of Roger, King of Sicily, who, being taken by force out of a monastery, was married to the Emperor Henry V, and by him was mother of Frederick II. She was fifty years old or more at the time, and, because it was not cred-

130. Paradise, C. I, l. 102, Longfellow

131. Paradise, C. H. 1, 94, Longfellow. See reference 104.

ited that she could have a child at that age, she was delivered in a pavilion, and it was given out that any lady who pleased was at liberty to see her." ¹³²

Yet behooves
Thou rest a little longer at the board,
Ere the crude aliment which thou hast taken,
Digested fitly to nutrition turn.¹³³

Behooves thee still to sit awhile at table,
Because the solid food which thou hast taken
Requireth further aid for thy digestion.¹³⁴

Though the matter under discussion was a theological question, it shows the Poet's oft noted tendency to illustrate his discourse with medical terms. It shows also he well knew the necessity for rest after ingestion of an abundant meal.

Still doth the mournful Cleopatra weep
Because thereof, who, fleeing from before it,
Took from the adder *sudden* and *black* death.¹³⁵

The terrible puff-adder, a member of the viper family, is a native of Africa, and

132. *Paradise*, C. III, Cary's notes.

133. *Paradise*, C. V, Cary.

134. *Ibid.*, Longfellow.

135. *Paradise*, C. VI, Longfellow.

is one of the commonest as well as most deadly of poisonous snakes.

"Rattlesnake Bite.—The pain of the wound is severe, and is speedily followed by swelling and *discoloration*. Constitutional symptoms consist in progressive prostration, staggering gait, cold sweats, nausea and vomiting, quick and feeble pulse, and slight mental disturbance. The patient may die within twelve hours.

"Bite of European Viper.—The bite is immediately followed by local pain of a burning character. The limb soon swells and becomes discolored. Great prostration, vomiting and clammy perspiration occur. In from twelve to twenty-four hours the severe constitutional symptoms may pass off; but in the meantime the swelling and discoloration have spread enormously.

"Bite of the Indian Viperine Snake.—Sanious discharges from the rectum and other orifices are prominent features. When the patient has recovered from the severe prostration and symptoms of ad-

vancing paralysis, he suffers from hemorrhagic extravasation in various organs, and from the bowels, lungs, nose and mouth." ¹³⁶

Ample exceedingly would be the vat
That of the Ferrarese could hold the blood,
And weary who should weigh it ounce by ounce.¹³⁷

As a fine ruby smitten by the sun.¹³⁸

"The Balais ruby gives health to the body. Its powder taken in water cures diseases of the eyes and pains in the liver." ¹³⁹

Not for the world which people toil for now
In following Ostiense and *Taddeo*.¹⁴⁰

Taddeo Alderotti was a distinguished physician and professor at Bologna, who flourished in the thirteenth century. Villani says of him: "At this time (1303) died in Bologna Maestro Taddeo, sur-

136. A System of Medicine, Allbutt, vol. ii. See notes on Hell, p. —

137. Paradise, C. IX.

138. Paradise, C. IX, Longfellow.

139. King: Antique Gems. Longfellow's notes, p. 210, Paradise.

140. Paradise, p. 12, Longfellow.

named the Bolognese, though he was a Florentine, and our fellow-citizen. He was the greatest physician in all Christendom."

Thence it descends to the last potencies.
Downword from act to act becoming such
That only brief *contingencies* it makes;
And these contingencies I hold to be
Things generated, *with seed and without*.

"These *contingencies* are animals, plants and the like, produced by the influences of the planets from seeds, and certain insects and plants, believed of old to be born without seed."¹⁴¹ The doctrine of spontaneous generation, fully believed in up to the eighteenth century, even to the generation of the lowest forms of animal life, and not disposed of finally until within the last three decades.

In such composed and seemly fellowship,
Such faithful and such fair equality,
In so sweet household, *Mary* at my birth
Bestowed me, *called on with loud cries*.¹⁴²

141. Paradise, C. XIII, notes, p. 255, Longfellow.

142. Paradise, C. XV, Cary. See Purgatory, C. XX.

You are my ancestor.
 Then tell me, my beloved root ancestral,
 Who were your ancestors.
 With voice more sweet and tender, but not in
 This modern dialect, it said to me:
 "From uttering of the Ave¹⁴³ till the birth
 In which my mother, who is now a saint,
 Of me was lightened who had been her bur-
 den.¹⁴⁴

Note again Dante's disposition to use medical phraseology.

Ever the intermingling of the people
 Has been the source of malady in cities,
 As in the body food it surfeits on.¹⁴⁵
 For if thy utterance shall offensive be
 At the first taste, a vital nutriment
 'Twill leave thereafter, when it is digested.¹⁴⁶
 And as a sleep is broken and dispersed
 Through sharp encounter of the nimble light
 With the eye's spirit,¹⁴⁷ running forth to meet
 The ray, from *membrane* on to the *membrane*
 urged.¹⁴⁸

143. Luke I, 28.

144. Paradise, C. XVI, Longfellow.

145. Paradise, C. XVI.

146. Paradise, C. XVII.

147. Vita Nuova, Chap. 2.

148. Paradise, C. XXVI, Cary.

And as at some keen light one wakes from sleep
By reason of the visual spirit¹⁴⁹ that runs
Unto the splendor passed from *coat* to *coat*.¹⁵⁰

Even as the sudden lightning that disperses
The visual spirits,¹⁵¹ so that it deprives
The eye of impress from the strongest objects,
Thus round about me flashed a living light,
And left me swathed around with such a veil
Of its effulgence, that I nothing saw.¹⁵²

There is no babe that leaps so suddenly
With face towards the milk, if he awake
Much later than his usual custom is,
As I did, that I might make better mirrors
Still of mine eyes.¹⁵³

But ye are sick,
And in your tetchy wantonness as blind
As is the bantling that of hunger dies,
And drives away the nurse.¹⁵⁴
The King, by means of whom this realm reposes
In so great love and in so great delight
That no one will venture to ask for more,
In his own joyous aspect every mind

149. Vita Nuova, Chap. 3.

150. For an exhaustive discussion of optics, see Con-
vito, III, Chap. 9; Paradise XXVI, Longfellow.

151. The Vita Nuova and its Author, pp. 203-205.
Boswell.

152. Paradise, C. XXX, Longfellow.

153. Paradise, C. XXX, line 82, Longfellow.

154. Paradise, C. XXX, Cary.

Creating, at his pleasure dowers with grace
Diversely; and let here the effect suffice.
And this is clearly and expressly noted
For you in Holy Scripture, *in those twins*
Who in their mother had their anger roused.¹⁵⁵

Jacob and Esau.

"And Isaac intreated the Lord for his
wife because she was barren; and the Lord
was intreated of him, and Rebekah his
wife conceived. And the children strug-
gled together within her; and she said, If
it be so, why am I thus? And she went to
enquire of the Lord.

"And the Lord said unto her: Two na-
tions are in thy womb, and two manner
of people shall be separated from thy
bowels.

"And when her days to be delivered
were fulfilled, behold there were twins in
her womb." ¹⁵⁶

My tongue shall utter now no more,
E'en what remembrance keeps, than could the
babe's

That yet is moistened at his mother's breast.¹⁵⁷

155. Paradise, C. XXXII, Longfellow.

156. Genesis, xxv. 21-24.

157. Paradise, C. XXXIII, line 100, Cary.

O speech,
How feeble and how faint art thou, to give
Conception birth! ¹⁵⁸
Here vigor failed the towering fantasy;
But yet the will rolled onward, like a wheel
In even motion, by the Love impelled,
That moves the sun in heaven and all the
stars. ¹⁵⁹

158. Ibid., line 112.

159. Ibid., lines 132-135.

DANTE'S LETTERS.

When wounded thus, what I became, O Love,
Thou canst relate, not I,
Thou, the spectator of my lifeless state;
*For though the soul again frequent the heart,*¹⁶⁰
Oblivious ignorance attends
The state of separation, while it lasts.
When I revive and gaze upon the wound,
Which ruin brought as sudden as the blow,
No comfort can I find,
But every limb is shaken by my fears;
And then the sad, discolored features show
What was the thunderbolt which struck me
down.¹⁶¹

"This is the sick sheep that *contaminates the flock* of its master *by contact*."

"In very truth from her evaporating corruption she exhales an *infectious smoke*, and thence the neighboring flocks all unconscious waste away."¹⁶²

That diseases both *contagious* and *infectious* invaded the flocks, Dante very

160. The doctrine of Aristotle that the heart was the seat of the intelligent soul. See p. — these notes on Purgatory.

161. Letter III, Latham.

162. Letter VII, Latham.

well knew. He here makes the distinction between the two.

That pleuro-pneumonia is both contagious and infectious has been proved by direct experiments performed in France, and reported by Professor Bouley.¹⁶³

In the cattle plague, rinderpest, sheep can be inoculated from cattle and cattle from sheep without modifying the virulence of the virus.¹⁶⁴

Variola ovina (sheep-pox) is a contagious and infectious eruptive disease analogous to small-pox and cow-pox.¹⁶⁵

Charbon (anthrax) was known to the ancients.

163. *Veterinary Medicine*, p. 146, Williams.

164. *Ibid.*, p. 137.

165. *Ibid.*

MEDICAL CONTEMPORARIES.

TADDEO ALDEROTTI, professor at Bologna.¹⁶⁶

MUNDINUS (1275-1327), the father of modern anatomy, was one of the earliest teachers of surgery at Bologna, and his "Anatomia" remained the standard textbook on the subject for more than two centuries.¹⁶⁷

DINO DEL GARBO, philosopher, scientist, first physician of Italy in his day. He lectured at Bologna, and afterwards at Siena. He wrote commentaries on Hippocrates, Galen and Avicenna.¹⁶⁸

TORRIGIANO, equal if not superior to Garbo. He studied at Bologna, and lectured at Paris. He wrote commentaries on the Greek physicians, and several treatises on medical subjects. He died before 1327.¹⁶⁹

166. Rashland: *Universities of the Middle Ages*, vol. i.

167. Rashland: *Universities of the Middle Ages*, vol. i.

168. *History of Medicine*. Baas. Trans. of H. E. Handerson, p. 268.

169. *Ibid.*, p. 287.

WILLIAM OF SALICET (1200-1280). The first of his day who wrote on surgery from personal experience, and who did not blindly follow the opinions of the masters.¹⁷⁰

LANFRANCE, pupil of William of Salicet. Taught surgery in Paris in 1295. He wrote on surgery. Died about 1306.¹⁷¹

ARNOLD OF VILLENEUVE (1234-1313). He discovered alcohol, oil of turpentine, aromatic waters, and introduced chemical compounds into therapeutics. He was one of the first to use brandy in medical practice, which he regarded as the elixir of life. He studied seven years in Montpellier, twenty in Paris, visited all the universities of Italy, and went to Spain to study the Arabic authors.¹⁷²

170. Ibid., p. 300.

171. Ibid., p. 304.

172. Ibid., p. 268.

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